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Late Holocene changes in carbon accumulation across major ecosystem transitions of a raised bog in southern Sweden

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Peatlands provide significant stores for carbon (C) derived from the atmosphere, but C-accumulation rates vary over time dependent of factors such as climate, vegetation and hydrology. Reccurrence surfaces or RY´s are characteristic in peat profiles from raised bogs, where peat is formed by *Sphagnum* mosses. RY´s constitute distinct transitions from peat with a high degree of humification to peat with a low degree of humification. Based on the contrasting depositional environments reflected by the surfaces, RY´s are traditionally interpreted to reflect rapid climatic shifts towards wetter conditions.

Twenty years after the onset of the comprehensive research on the overall Holocene stratigraphy and biogeochemistry of Store Mosse in Southern Sweden [1,2,3] we returned to the bog in order to conduct an in depth study of one selected core point in the southern part of the bog. High resolution sampling and examination of paleo-ecology and biogeochemistry in combination with an extensive dating programme across two late Holocene RY´s, allowed for detailed assessment of changes in C-accumulation during the relatively rapid shifts in the ecosystem as represented by the RY´s. Overall, the results support previous investigations, but our high resolution approach provides new insights to short term changes in C-accumulation during major ecosystem transitions of the bog. Hence, very different C-accumulation patterns were found across the two transitions, despite their similar appearance. This observation warrants cautiousness when estimating past changes in C accumulation across major ecosystem transitions identified in peat records.

References

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